

ABSTRACT OF THE DISCLOSURE

A sponge core barrel for use in performing sponge coring and methods of assembling the sponge core barrel, as well as methods of performing sponge coring. The sponge core barrel includes an outer barrel assembly, a core bit secured to a lower end thereof, and an inner barrel assembly disposed therein. The inner barrel assembly may comprise multiple, sponge-lined inner tube sections and may also include a near-bit swivel assembly. The sponge core barrel may include a piston assembly configured to be released by contact with a core sample without imparting high compressive forces to the core. The sponge core barrel may also include a pressure compensation mechanism and, optionally, a thermal compensation mechanism cooperatively configured to maintain the pressure of pre-saturation fluid. The sponge core barrel may also include a valve assembly enabling the make-up and pre-saturation of multiple, sections of inner tube to form a single, continuous chamber.

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